CLAIMS

1.   A variant of a parent Glycoside Hydrolase Family 53 galactanase, comprising an alteration in at least one of the following positions: -6, -4, -2, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 22, 24, 25, 26, 29, 30, 31, 32, 36, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 54a, 54e, 54f, 54g, 54h, 55, 56, 57, 58, 61, 62, 65, 69, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 101, 106, 107, 110, 113, 114, 126, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 144, 145, 146, 147, 150, 153, 157, 159, 163, 169, 171, 172, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192, 194, 198, 200, 203, 204, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 252, 252d, 252e, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 273, 274, 276, 277, 280, 283, 284, 286, 288, 288a, 289, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 302a, 302d, 302j, 302k, 302m, 302n, 302o, 302q, 302r, 302s, 302t, 302u, 302v, 302x, 302y, 302z, 302aa, 302bb, 302cc, 302dd, 302ee, 302ff, 302gg, 302hh, 302ii, 302jj, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, and 330; wherein

(a) the alteration(s) are independently

(i)   an insertion of an amino acid immediately downstream of the position,

(ii)   a deletion of the amino acid which occupies the position, and/or

(iii)   a substitution of the amino acid which occupies the position;

and

(b) the variant has galactanase activity.

2.   The variant of claim 1, wherein the variant comprises at least one of the following substitutions: -6P; -4P; -2P; 1P; 3P; 5A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 6A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 8A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 12A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 13A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 14A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 15A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 16A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 18A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 24C,P; 25P; 26P; 29P; 30C; 31P; 32A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 36A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 39C; 40C; 41P; 43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 46A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

51A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 52A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 54A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   54aP; 54eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

54gA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

54hA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

55A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   56A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

58A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

62C; 65C; 69C; 77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

79A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 80A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

81A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 84A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

87A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 88A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

89A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 90A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

91A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 92A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 94A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

95A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 96A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

97P; 101P; 106C; 107H,S; 110C; 113C; 114C; 126E;

131A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

133A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   134A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

135A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

136A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

139A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   140A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

141A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 144P;

146A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 147P; 150C; 159C; 163C; 169P; 171P;

172P; 178A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   179A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

180A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

181A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

182A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

186A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

188A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

189A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

191A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

194C; 198P; 200P; 203P; 204P; 210A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

215A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   216A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 216FVASTG;

217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

219A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   221A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

223A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

224A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

225A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   226A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

227A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

230A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   231A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

232A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

233A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

234C; 241A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

242A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

245A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

247A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

249A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

250A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   252A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

252dA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

252eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

253A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

254A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   255A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

258A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

259A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   260A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

261A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

262A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

264A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   265A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

266P; 273A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 274C;

276A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

277A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   283A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 286P; 288P; 288aP; 289P;

293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

294A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   297A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

298A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

299A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

301A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   302A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 302dP;

302jA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302kA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302mA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302oA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302rA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302tA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   302vA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y,

302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302aaA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   302bbA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 302ccP;

302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302eeA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302ffA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302ggA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   302hhA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302iiA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

302jjA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

303A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

304A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   305A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

306A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

307A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   310A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

311A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

312A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

313A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

314A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   315A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

316A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

317A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

318A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

320A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

321A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

322A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   323A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 324P; 325P;

326A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 327P; 328C;

329A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or 330C.

3.   The variant of any one of claims 1-2, wherein the variant comprises at least one of

10   the following substitutions: *-6P; *-4P; *-2P; A1P; T3P;

R5A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; V12A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

15   V13A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; V14A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,,W,Y;

E15A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A18C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

N24C,P; T25P; N26P; A29P; Q30C; L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

20   L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; N39C; G40C; V41P;

T43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,,W,Y;

25   N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A53C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*54aP; *54eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*54gA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   *54hA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

N58A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   N62C; I65C; A69C; Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,,V,W,Y; W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H91A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

5   T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; M94A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

95A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A96C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G97P; D101P; S106C; W107H,S; Y110C; T113C; L114C; Q126E;

131A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

R137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; T144P;

R146A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; T147P; W150C; S159C; G163C; 169P;

K172P; H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D184A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

G186A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   W191A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;N194C; Q198P; T200P; L203P; S204P;

G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

F213A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S219A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

S224A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A225C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

10   K227A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

S228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D231A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

M233A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y; A234C;

I241A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

A242C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

20   V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

25   P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

I250A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*252dA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*252eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   P253A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

N254A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

R256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   S258A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S261A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

K264A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

N265A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; I266P;

5　　Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T274C;

276A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; I277A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

I283A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; S286P; S288P; *288aP, R289P;

L293A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

10　　F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

15　　A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

H302A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20　　*302dP; *302jA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302kA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302mA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302oA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25　　*302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302rA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302tA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30　　*302vA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y,

*302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302aaA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35　　*302bbA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; *302ccP;

*302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302eeA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302ffA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302ggA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302hhA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302iiA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302jjA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N305A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T314A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S317A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

20   Q318A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

S319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G320A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q321A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A322C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   L323A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S324P; S325P;

L326A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S327P; V328C;

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or Q330C.

4.   The variant of any one of claims 1-3, wherein the variant comprises at least one of

30   the following substitutions: G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; V12A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V13A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; V14A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,,W,Y;

35   E15A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A18C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N24P; T25P; A29P;

L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N39C; T43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

5   V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,,W,Y; N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A53P;

D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,,V,W,Y;

W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

15   A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H91A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M94A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y; 95A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D101P; W107H,S; Y110C; Q126E; G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

20   E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

R137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

25   L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; T147P; W150C; G163C;

H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D184A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

35   G186A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N194C; Q198P; L203P; S204P;

G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

F213A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5　　Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

10　　S219A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

15　　S224A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A225C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

K227A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

S228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

20　　S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D231A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

M233A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

25　　I241A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

A242C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30　　T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

I250A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

35　　C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

R256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S258A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   V263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T274C;

F276A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I277A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

10   I283A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; S288P;

L293A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

15   E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   H302A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N305A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

25   G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T314A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   S317A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Q318A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

S319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G320A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q321A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A322P; S324P; S325P; L326A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S327P; V328C;

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or Q330C.

5.   The variant of any one of claims 1-4, wherein the variant comprises at least one of the following substitutions:

(a) Y214N,S+N247Y+L306Q; Y214A; F216FVASTG ; and/or P89W+W86N;

(b) A90S+H91D; H91N,L,D; N313D; N303D,H; and/or N305D,H;

(c) Y22P, N24P, T25P, A29P, A53P, N56P, T93P, D101P, W142P, T147P, Q198P, L203P, S204P, S219P, S258P, S288P, A304P, A311P, Q318P, A322P, S324P, S325P, and/or S327P;

(d) W107S,H;

(e) Q126E;

(f) N39C+L326C; V20C+G320C; Y110C+G163C; W150C+N194C; T274C+V328C; and/or I301C+F316C; and/or

(g) G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; W9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; V12A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; V13A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; V14A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; E15A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A18C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; T43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H91A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M94A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y; P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

5 E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

R137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

10 L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15 N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D184A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

20 G186A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25 V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

F213A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

30 F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S219A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

35 A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

S224A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A225C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

K227A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

S228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

5   S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D231A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

M233A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

10   I241A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

A242C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

I250A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

R256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S258A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

25   F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

30   F276A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I277A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

I283A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

L293A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

35   F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   H302A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N305A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

10   G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T314A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   S317A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Q318A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

S319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G320A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q321A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

25   L326A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; and/or

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y.

6.   The variant of any one of claims 3-5 which is a variant of a *Myceliophthora thermo-*
phila galactanase.

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7.   The variant of any one of claims 1-2, wherein the variant comprises at least one of
the following substitutions: *-6P; *-4P; *-2P; A1P; Q3P;

K5A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D7A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; W8A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y ;

35   W9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; V12A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

M13A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y; V14A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E15A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A18C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;
Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N24C,P; V25P; N26P; E29P; K30C;
L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;
39C; G40C; V41P; M43A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

5 V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;
Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;
V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;
V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

10 W53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
D54A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; *54aP;
*54eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
*54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
*54gA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15 *54hA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N58A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N62C; L65C; A69C;
Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N79A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

20 F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;
D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; I85A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;
W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

25 A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H91A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;
T94A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;
A96C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; G97P; D101P; A106C; W107H,S; Y110C;
T113C; L114C; Q126E; S131A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

30 G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;
T137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

35 G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;
L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;
W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; L144P;

K146A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;W142P; T147P; W150C; S159C; G163C;

L169P; K172P; H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

N184A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

10   D186A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W191A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; N194C; Q198P; M203P; S204P;

15   G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

F213A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

20   P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 216FVASTG;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A219C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D224A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   S225A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

R227A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

R228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

35   L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N231A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

M233A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y; V234C;

V241A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

A242C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

5   V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

10   P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

T250A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*252dA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*252eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   P253A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

Y254A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

R256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

20   Q258A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A261C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   V263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

R264A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

N265A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; V266P;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T274C;

276A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; I277A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V283A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; S286P; S288P; *288aP; K289P;

L293A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

H302A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   *302dP; *302jA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302kA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302mA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302oA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   *302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302rA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302tA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   *302vA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y,

*302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302aaA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   *302bbA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; *302ccP;

*302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302eeA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302ffA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302ggA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   *302hhA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302iiA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302jjA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   N305A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

35   C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T314A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T317A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

P318A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G320A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q321A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A322C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L323A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S324P; S325P;

L326A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S327P; V328C;

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or H330C.

8.   The variant of claim 7, wherein the variant comprises at least one of the following substitutions: G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y ;

W9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; V12A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

M13A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y; V14A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E15A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A18C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; V25P; E29P;

L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

V41P; M43A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

W53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D54A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

N58A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N79A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H91A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

5   T94A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; A96C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T113C; G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

10 T137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; G163C; L169P;

15 H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20 W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

N184A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D186A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

25 Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; Q198P; M203P;

G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

30 F213A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; 216FVASTG;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35 S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A219C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D224A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   S225A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

R227A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

R228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

10   L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N231A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

M233A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

V241A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

15   A242C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

20   N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

25   R256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Q258A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A261P;

30   D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

Y276A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

I277A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V283A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; S288P;

L293A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

5   A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

H302A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

10   A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N305A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

15   S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

20   T314A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T317A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

P318A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

25   S319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G320A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q321A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; A322P; S324P; S325P;

L326A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F329A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; and/or H330C.

30

9.   The variant of claim 8, wherein the variant comprises at least one of the following substitutions:

(a) V20P, V25P, E29P, V41P, V50P, W53P, N56P, T94P, A96P, W142P, L169P, W185P, Q198P, M203P, A219P, A221P, T222P, Q258P, A261P, D262P, S288P, N305P, A311P,

35   A322P, S324P, and/or S325P;

(b) T113C+G163C, W185C+S229C, S218C+A221C, R227C+V283C; and/or

(c) G6A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

V7A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

D8A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

W9A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

S10A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

5　V12A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

M13A,C,D,E,F,G,H,I,J,K,L,N,P,Q,R,S,T,V,W,Y;

V14A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

E15A,C,D,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

E16A,C,D,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

10　A18C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

V20A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

Y22A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

L32A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

L36A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

15　M43A,C,D,E,F,G,H,I,J,K,L,N,P,Q,R,S,T,V,W,Y;

V44A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

R45A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,S,T,V,W,Y;

Q46A,C,D,E,F,G,H,I,J,K,L,M,N,P,R,S,T,V,W,Y;

R47A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,S,T,V,W,Y;

20　V48A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

W49A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

V50A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

N51A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

P52A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

25　W53A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

D54A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

G55A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

N56A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

Y57A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

30　N58A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

Y61A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

Y77A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

N79A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

F80A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

35　H81A,C,D,E,F,G,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y82A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

S83A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

D84A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

T85A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

W86A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

A87C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   D88A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

P89A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

A90C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

H91A,C,D,E,F,G,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,J,K,L,M,N,P,R,S,T,V,W,Y;

10   T93A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

T94A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

A96,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

G133A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

15   E135A,C,D,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

T137A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

G139A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

L141A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

20   W142A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

H178A,C,D,E,F,G,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

L179A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

N181A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

25   G182A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

N184A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

W185A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

D186A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   T187A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

Q188A,C,D,E,F,G,H,I,J,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

G210A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

35   S212A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

F213A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y214A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

60

F216A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y217A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

A219C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   S220A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

D224A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   S225A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

L226A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

R227A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,S,T,V,W,Y;

R228A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,S,T,V,W,Y;

S229A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

15   L230A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

N231A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

M233A,C,D,E,F,G,H,I,J,K,L,N,P,Q,R,S,T,V,W,Y;

V241A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

20   A242C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

V244A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

25   N247A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

P249A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

C252A,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

30   R256A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

Q258A,C,D,E,F,G,H,I,J,K,L,M,N,P,R,S,T,V,W,Y;

F259A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

35   D262A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

V263A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

Q273A,C,D,E,F,G,H,I,J,K,L,M,N,P,R,S,T,V,W,Y;

Y276A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

I277A,C,D,E,F,G,H,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

V280A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

V283A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,W,Y;

L293A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

5   F294A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

10   A299C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

H302A,C,D,E,F,G,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

15   A304C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

N305A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

20   S309A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T,V,W,Y;

25   T314A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

M315A,C,D,E,F,G,H,I,J,K,L,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

T317A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S,V,W,Y;

P318A,C,D,E,F,G,H,I,J,K,L,M,N,Q,R,S,T,V,W,Y;

30   S319A,C,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,T,V,W,Y;

G320A,C,D,E,F,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q321A,C,D,E,F,G,H,I,J,K,L,M,N,P,R,S,T,V,W,Y;

L326A,C,D,E,F,G,H,I,J,K,M,N,P,Q,R,S,T,V,W,Y; and/or

F329A,C,D,E,G,H,I,J,K,L,M,N,P,Q,R,S,T,V,W,Y.

35

10.   The variant of any one of claims 7-9 which is a variant of a *Humicola insolens* galactanase.

11.   The variant of any one of claims 1-2, wherein the variant comprises at least one of
the following substitutions: *-6P; *-4P; *-2P; A1P; T3P;

R5A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A7C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y ; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y ;

5   I9A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; L12A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L13A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L14A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L15A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E18A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   Y20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

N24C,P; L25P; N26P; T29P; Q30C; A31P; L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; A39C; G40C; I41P;

S43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; I44A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

15   R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*54aP; *54eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   *54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*54gA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*54hA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; S56A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; D58A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; N62C; L65C; V69C;

Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L80A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L82A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

30   W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S90A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D91A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

T94A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

35   S96A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; G97P; D101P; K106C; W107H,S; Y110C;

T113C; L114C; D126E; G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

R137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; L144P;

E146A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T147P; Y150C; S159C; G163C; L169P;

T171P; T172P; H178A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D181A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

S184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D186A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q187A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

N189A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

F191A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T194C; T198P; E200P; S203P; T204P;

G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A219C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

A224C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S225A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

K227A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

T228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

5   A231C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L233A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; Q234C;

V241A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V242A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

10   V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

15   W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

V250A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*252dA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   *252eA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P253A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

N254A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A256C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

A258C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S261A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

30   D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L263A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S264A,C,D,E,F,G,H,I,K,L,M,N,P,Q,T,V,W,Y;

S265A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; I266P;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; Q274C;

F276A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   L277A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L280A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

V283A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; A286P; T288P; *288aP, D289P;

V293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

65

Y294A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

G302A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   *302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302dP; *302jA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302kA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302mA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   *302oA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302rA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302tA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   *302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302vA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y,

*302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   *302aaA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302bbA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; *302ccP;

*302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302eeA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302ffA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   *302ggA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302hhA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302iiA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*302jjA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

35   A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G305A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L314A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

10   V316A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

D317A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y318A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

T319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

D320A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   E321A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V322A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Y323A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; E324P; S325P;

I326A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; E327P; T328C;

L329A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; and/or G330C.

20

12.   The variant of claim 11, wherein the variant comprises at least one of the following
substitutions: T3P; R5A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A7C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y ; I9A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L12A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L13A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L14A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L15A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E18A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

30   N24C,P; L25P; T29P; Q30C; A31P; L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

I44A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

35   V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; S53P;

D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S56A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; L65C;

Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L80A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L82A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

5   D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S90A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D91A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

10   T94A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

S96P; G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   R137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; L144P; E146P; T147P; T172P;

H178A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D181A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

25   S184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D186A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q187A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

30   N189A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

F191A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

E200P; S203P; G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

35   Y213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A219C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

5   A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

A224C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S225A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

10   L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

K227A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

T228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

15   A231C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L233A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

V242A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

20   V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

25   P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A256C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

30   A258C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; S261P;

D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L263A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S264P; I266P;

35   Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

F276A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L277A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L280A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

V283A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; T288P;

V293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Y294A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

5   W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

10 I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

G302A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G305A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15 L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20 A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L314A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

25 V316A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

D317A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y318A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

T319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

D320A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30 E321A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V322A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

Y323A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

E324P; S325P; I326A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; E327P; T328C;

L329A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; and/or G330C.

35

13.   The variant of claim 12, wherein the variant comprises at least one of the following substitutions:

(a) D181N, D181N+S90A+D91H;

70

(b) T3P, Y20P, N24P, L25P, T29P, A31P, V50P, S53P, S56P, T93P, T94P, S96P, W142P, L144P, E146P, T147P, T172P, E200P, S203P, A219P, A256P, A258P, S261P, S264P, I266P, T288P, I301P, A304P, Y318P, and/or E324P;

(c) L13C+L65C, N24C+Q30C, S218C+A221C, A304C+Y318C; and/or

(d) R5A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A7C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; I9A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; L12A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L13A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L14A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L15A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E18A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y22A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; L32A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; I44A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; Q46A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; V48A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; V50A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; N51A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; S56A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; Y57A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y61A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; Y77A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; L80A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; L82A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; T85A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; S90A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D91A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; T93A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; T94A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; I136A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; R137A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; L141A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; W142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; L179A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D180A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D181A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G182A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W183A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

5   S184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

W185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

D186A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q187A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

Q188A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

10   N189A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G210A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

15   Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

20   A219C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S220A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A221C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

25   A224C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S225A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

K227A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

T228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

30   S229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

A231C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N232A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L233A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

35   V242A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V244A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N247A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

W248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

P249A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

5   C252A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P255A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A256C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y257A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

A258C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   F259A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P260A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

D262A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L263A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

15   F276A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L277A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

L280A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

V283A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

20   Y294A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

25   A2990C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

G302A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N303A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

30   A304C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G305A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L306A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

35   S309A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

C310A,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A311C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D312A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

73

N313A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L314A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

M315A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

V316A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

5   D317A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y318A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

T319A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

D320A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V322A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

10   Y323A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

I326A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or

L329A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; and/or

(e) I9F,Y,W; L12V; L80F; L82Y; F191Y,W; Y213F; I9W+L12V; L82Y+L80F.

15   14.   The variant of any one of claims 11-13 which is a variant of an *Aspergillus aculeatus*
       galactanase.

       15.   The variant of any one of claims 1-2, wherein the variant comprises at least one of
       the following substitutions: K-6P; S-4P; L-2P; K1P; F3P;

20   K5A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y ;

V9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; I12A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

I13A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; A14C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   L15A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; E16A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S18A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; V20A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

F22A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N24C,P; E25P; S26P; K29P; Q30C; D31P;

I32A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; L36A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

A39C; G40C; V41P; Y43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

30   V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

V46A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

I48A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

N50A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; D51A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; Y53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   D54A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A54aP;

G54eA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

G54gA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G54hA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

N57A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; D58A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

K61A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; A62C; I65C; A69C;

L77A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F85A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

10   A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; K91A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; K93A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

A94C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

K96A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; A97P; N101P; K106C; T107H,S; Y110C;

T113C; K114C; D126E; Q131A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

15   G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T136A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N137A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

20   G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

A141C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; *144P;

G146A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E147P; W150C; A159C; A163C; *169P;

25   S171P; N172P; H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

F179A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T180A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P182A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

30   E183A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S185A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G186A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

R187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

35   Y188A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

A189C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

I191A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; T194C; H198P; *200P; H203P; V204P;

A210C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

5   P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

W217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

*218A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*219A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   H220A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G221A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

K224A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

15   N225A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

T227A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S228A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

V229A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

20   L230A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

T231A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S232A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

V233A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; A234C;

V241A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

25   M242A,C,D,E,F,G,H,I,K,L,N,P,Q,R,S,T,V,W,Y;

V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

A244C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

30   S247A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

T249A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

Y250A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

A252C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   D252dA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G252eA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H253A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G254A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N255A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

A257C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   P258A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

K259A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

N260A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G261A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q262A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

10   T263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

L264A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N265A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

N266P; Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y; A274C;

A276C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   V277A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

A283C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D286P; G288P; E288aP, A289P;

V293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

P302A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

V302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

A302dP; N302jA,C,D,E,F,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

30   K302kA,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

L302mA,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E302oA,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   G302rA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G302tA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

A302vC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y,

S302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

5   A302aaC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A302bbC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E302ccP;

Y302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

D302eeA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P302ffA,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

10   E302ggA,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D302hhA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A302iiC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G302jjA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

K303A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

15   W304A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

F305A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G306A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

20   A309C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V310A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

D311A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N312A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

Q313A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

25   A314C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L315A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D317A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

F318A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   K319A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

G320A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

R321A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

P322A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

L323A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; S325P;

35   L326A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; H327P; V328C;

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or Q330C.

16.   The variant of claim 15, wherein the variant comprises at least one of the following
substitutions: K-6P; S-4P; L-2P; K1P; K5A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;
G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;
D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;
5   S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;
A14C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; L15A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;
S18C;V20P; S26P; K29P; D31P; G40C; Y43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;
V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;
V46A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;
10   I48A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;
N50A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; D51A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; Y53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;
A54aP; G54eA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
Y54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; G54gA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
15   G54hA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; N57A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
A62C; A69C; L77A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;
D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;
20   S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
F85A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;
A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
K91A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;
25   K93A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; A94C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A97P; N101P; K106C; K114C;
Q131A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;
G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
30   E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
T136A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;
N137A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;
G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;
35   A141C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;
*142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; *144P;
G146A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; A159C; A163C; S171P;
H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

F179A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T180A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

P182A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

5   E183A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; S185P;

R187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y188A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

10   S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

15   W217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

H220A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G221A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

20   N225A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

T227C; A234C; V241C; V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

A244C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S247A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

T249A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

.Y250C; D252dA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   G252eA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H253A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G254A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N255A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

35   A257C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P258A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

K259A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

N260A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G261A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q262A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

T263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

5   L264A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N265A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

N266P; Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A276C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V277A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

10   V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; A283C; D286P; E288aP; A289P;

V293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

15   E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   V302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; A302dP;

N302jA,C,D,E,F,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

K302kA,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

L302mA,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

W302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

25   E302oA,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

G302rA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

G302tA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   W302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

A302vC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y,

S302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   A302aaC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A302bbC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; E302ccP;

Y302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

D302eeA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P302ffA,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

E302ggA,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D302hhA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A302iiC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G302jjA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

K303A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

W304A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

F305A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G306A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A309C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V310A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

D311A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N312A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

Q313A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A314C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L315A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F318P;

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or Q330C.

17.   The variant of claim 16, wherein the variant comprises at least one of the following substitutions:

(a) K-6P, S-4P, L-2P, K1P, V20P, S26P, K29P, D31P, A54aP, G54eP, N57P, K93P, A97P, N101P, S171P, S185P, T256P, N260P, N266P, D286P, E288aP, A289P, A302dP, S302yP, Y302zP, A302bbP, E302ccP, E302ggP, F305P, D311P, F318P;

(b) S18C+Y302qC, G40C+Q330C, V44C+A69C, I48C+A62C, N50C+D84C, G54gC+T302xC, N56C+G302rC, A62C+G146C, K106C+A159C, K114C+A163C, E183C+G221C, T227C+A283C, A234C+V241C, Y250C+Q273C, A302aaC+A302iiC; and/or

(c) K5A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; G6A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V7A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; D8A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; V9A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; S10A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; S11A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; A14C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; L15A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y; Y43A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W; V44A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R45A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; V46A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; R47A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y; I48A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y; W49A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y; N50A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; D51A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P52A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; Y53A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

G54eA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y54fA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

G54gA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G54hA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   G55A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; N56A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

N57A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y; L77A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

D79A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F80A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H81A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y; Y82A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

S83A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y; D84A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

10   F85A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; W86A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

A87C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; D88A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P89A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; A90C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

K91A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; Q92A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

K93A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y; A94C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

15   P95A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y; Q131A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

G133A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N134A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

E135A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T136A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

20   N137A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G139A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

L140A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

A141C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

*142A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; *144P;

25   G146A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H178A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

F179A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T180A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

N181A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

30   P182A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

E183A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T184A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

R187A,C,D,E,F,G,H,I,K,L,M,N,P,Q,S,T,V,W,Y;

Y188A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

35   S211A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

S212A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

Y213A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

Y214A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

P215A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

F216A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; F216FVASTG;

W217A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

H220A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   G221A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T222A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

L223A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N225A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

L226A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

10   V243A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

A244C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

E245A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T246A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

S247A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

15   Y248A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

T249A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y; Y250C;

D252dA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G252eA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

H253A,C,D,E,F,G,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

20   G254A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N255A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

T256A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

A257C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P258A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

25   K259A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

N260A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

G261A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Q262A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

T263A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y;

30   L264A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

N265A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

Q273A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A276C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V277A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

35   V280A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

V293A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

F294A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y295A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

W296A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E297A,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

P298A,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

A299C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   W300A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

I301A,C,D,E,F,G,H,K,L,M,N,P,Q,R,S,T,V,W,Y;

V302aA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y; N302jA,C,D,E,F,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

K302kA,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

L302mA,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

10   W302nA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

E302oA,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y302qA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

G302rA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

S302sA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

15   G302tA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

W302uA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

A302vC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

T302xA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,V,W,Y,

S302yA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

20   Y302zA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

A302aaC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A302bbC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

Y302ddA,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W;

D302eeA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

25   P302ffA,C,D,E,F,G,H,I,K,L,M,N,Q,R,S,T,V,W,Y;

E302ggA,C,D,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

D302hhA,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

A302iiC,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G302jjA,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

30   K303A,C,D,E,F,G,H,I,L,M,N,P,Q,R,S,T,V,W,Y;

W304A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,Y;

F305A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G306A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

G307A,C,D,E,F,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

35   S308A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,T,V,W,Y;

A309C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

V310A,C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,W,Y;

D311A,C,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

N312A,C,D,E,F,G,H,I,K,L,M,P,Q,R,S,T,V,W,Y;

Q313A,C,D,E,F,G,H,I,K,L,M,N,P,R,S,T,V,W,Y;

A314C,D,E,F,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y;

5   L315A,C,D,E,F,G,H,I,K,M,N,P,Q,R,S,T,V,W,Y;

F316A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y; and/or

F329A,C,D,E,G,H,I,K,L,M,N,P,Q,R,S,T,V,W,Y.

18.   The variant of any one of claims 15-17 which is a variant of a *Bacillus licheniformis*

10   galactanase.

19.   The variant of any one of claims 1-18, wherein the number designating each position is the number of the corresponding amino acid residue in SEQ ID NO: 1, said corresponding amino acid residue being derivable from an alignment according to Fig. 5 or 6, said align-

15   ment including the parent galactanase.

20.   The variant of any one of claims 1-19, wherein the parent galactanase has an amino acid sequence which has a degree of identity to the amino acid sequence of SEQ ID NO: 1 of at least 25%.

20

21.   The variant of any one of claims 1-20, wherein the parent galactanase is obtained from a strain of *Yersinia, Aspergillus, Humicola, Meripilus, Myceliophthora,* or *Thermomyces.*, or from a strain of *Bacillus, Bifidobacterium, Cellvibrio, Clostridium, Pseudomonas, Thermotoga,* or *Xanthomonas.*

25

22.   An isolated nucleic acid sequence comprising a nucleic acid sequence which en-codes the galactanase variant of any one of claims 1-21.

23.   A nucleic acid construct comprising the nucleic acid sequence of claim 22 operably

30   linked to one or more control sequences that direct the production of the galactanase variant in a suitable expression host.

24.   A recombinant expression vector comprising the nucleic acid construct of claim 23.

35   25.   A recombinant host cell comprising the nucleic acid construct of claim 23 or the vector of claim 24.

26.   A method for producing a galactanase variant of any one of claims 1-21, the method comprising (a) cultivating a recombinant host cell of claim 25; and (b) recovering the polypeptide.

5 27.   Use of at least one galactanase variant of any one of claims 1-17 in the dairy industry.

28.   Use of at least one galactanase variant of any one of claims 1-17 to prepare galacto-oligo-saccharides and/or for hydrolysis of lactose.

10